

IMAGES IN INTERVENTION

A Dual-Snare Percutaneous Retrieval of Venous Stent Embolization to the Right Heart

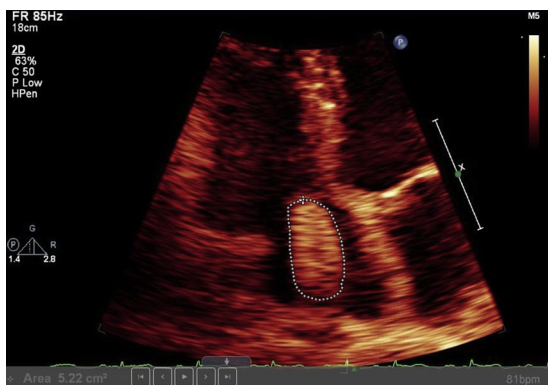


Ajay K. Sharma, MD, Sarju Ganatra, MD, James Hansen, MD, Neil Yager, DO, Thomas Piemonte, MD, Gautam Gadey, MD, Michael S. Levy, MPH, MD

A 57-year-old man with past medical history of asthma was transferred from an outside hospital for evaluation of cardiac mass where he was treated for extensive right lower extremity iliofemoral deep venous thrombosis with catheter-directed thrombolytic therapy and thrombectomy. Due to concern of compressive physiology at the site of thrombosis, 2 overlapping self-expanding WALLSTENT endoprostheses (Boston Scientific,

Marlborough, Massachusetts) (2 10 mm × 60 mm and 1 10 mm × 40 mm) were placed in the iliofemoral system. Shortly after the procedure an incidental transthoracic echocardiogram noted a right atrial mass (Figure 1). A transesophageal echocardiogram revealed a cylindrical foreign body extending from the inferior vena cava to the right atrium and across the tricuspid valve into the right ventricle. This was suspected to be a migrated venous stent (Figures 2A and 2B). This was confirmed by a computed tomography scan of the chest, abdomen, and pelvis (Figure 3). Percutaneous access was obtained in the right internal jugular vein (6-F sheath) and through the right common femoral vein for a 14-F Dexterity catheter (Spirus Medical, Stoughton, Massachusetts), which has the advantage of being a steerable catheter. A dual-snare approach was used: 25-mm snare from the groin and an Ensnare 18-30 (Merit Medical, South Jordan, Utah) from the right internal jugular vein. Fluoroscopy identified that 2 of 3 stents had embolized into the right atrium and right ventricle (Figure 4). These were removed separately by snaring them proximally and distally and ultimately stretching and compressing the diameter of the stent so it would fit into the 14-F Dexterity catheter (Figure 5, Online Video 1). At the end of the procedure, the femoral sheath was withdrawn and a previously placed Perclose (Abbott Vascular, Santa Clara, California) was used for hemostasis. The

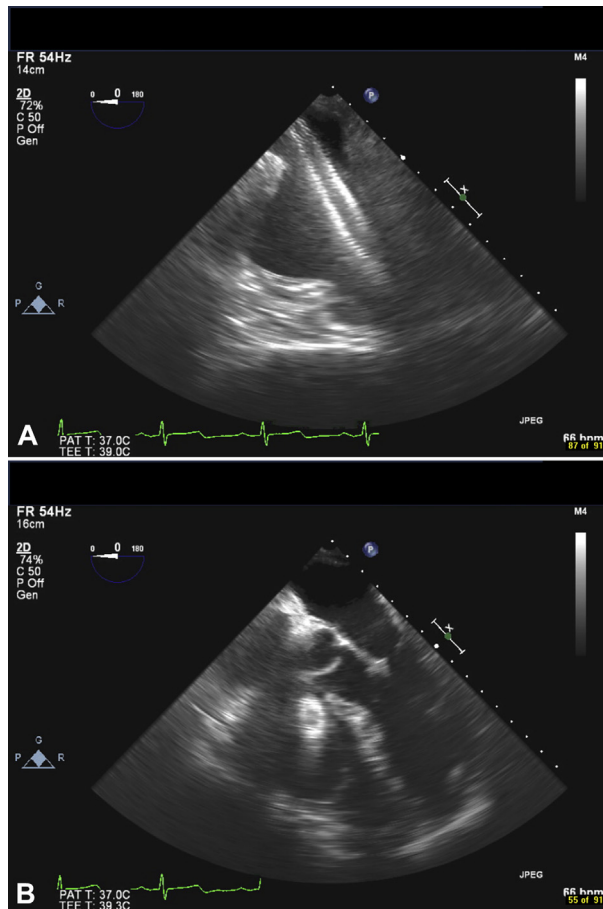
FIGURE 1 Transthoracic Echocardiographic Image Prior to Intervention



Transthoracic echocardiography done at outside hospital raising suspicion for a cardiac mass.

From the Department of Cardiovascular Medicine, Lahey Hospital and Medical Center, Burlington, Massachusetts. Dr. Piemonte is the Chief Medical Officer of and owns significant stock in Cardiosolutions (Stoughton, Massachusetts). All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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FIGURE 2 Transesophageal Echocardiographic Images Prior to Intervention

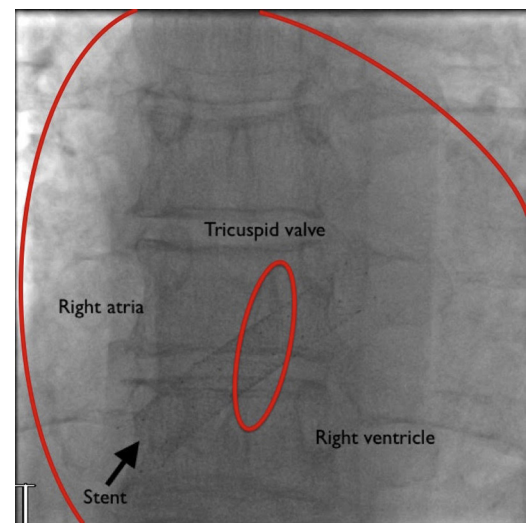
(A) Transesophageal echocardiography (TEE) image showing venous stent across the tricuspid valve into the right ventricle. (B) TEE image showing venous stent in right ventricle.

patient had an uneventful recovery and was discharged on rivaroxaban for follow up with vascular medicine.

With the advent of self-expanding venous stents there has been a growing enthusiasm in treating iliofemoral venous thrombosis with angioplasty and stenting when compressive physiology is suspected. This is most commonly considered in May-Thurner syndrome (1). Several case reports (2,3) describe embolization of these stents, highlighting the need to ensure adequate over sizing in the iliofemoral vessels. Additionally, there are several cases in the literature describing various approaches to stent

FIGURE 3 CT Chest Image Prior to Intervention

Computed tomography of the chest showing the 2 stents in right atrium and right ventricle.

FIGURE 4 Fluoroscopic Image Prior to Intervention

Fluoroscopy with pictorial representation showing the stents in right heart across the tricuspid valve.

retrieval (2,3). A double-snare technique can be used for safe percutaneous retrieval.

ADDRESS FOR CORRESPONDENCE: Dr. Ajay K. Sharma, Lahey Hospital and Medical Center, 41 Mall Road, Burlington, Massachusetts 01805. E-mail: ajay.sharma@lahey.org.

FIGURE 5 Embolized Venous Stent Post-Removal



One of the venous stents after it was removed successfully ([Online Video 1](#)).

REFERENCES

1. Carroll S, Moll S. Inferior vena cava filters, May-Thurner syndrome, and vein stents. *Circulation* 2016;133:e383-7.
2. El Feghaly M, Soula P, Rousseau H, et al. Endovascular retrieval of two migrated venous stents by means of balloon catheters. *J Vasc Surg* 1998;28:541-6.
3. Gabelmann A, Kramer SC, Tomczak R, Gorich J. Percutaneous techniques for managing maldeployed or migrated stents. *J Endovasc Ther* 2001; 8:291-302.

KEY WORDS embolization, intervention, snare, venous stents

APPENDIX For a supplemental video and its legend, please see the online version of this article.